VOLUME VI: Chapter 5

MODEL QA PLAN

Final Report

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DISCLAIMER

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INTRODUCTION

This is the final chapter of the *Quality Assurance Procedures* volume. The model quality assurance (QA) plan presented here illustrates the principles described in the other chapters of this volume. The plan uses fictitious Ozoneville for a QA plan for a State Implementation Plan (SIP) emissions inventory. Because it is intended to be a model QA plan, the remainder of this chapter does not adhere to Emission Inventory Improvement Program (EIIP) format and style used elsewhere in this volume.

This model QA plan was prepared by the EIIP Quality Assurance Committee. The EIIP Quality Assurance Committee was formed to develop (1) a plan for the EIIP's QA program, (2) a comprehensive QA procedures volume, and (3) an emission inventory quality rating system.

Throughout the EIIP QA procedures volume, the concept was developed of delineating inventories into one of four inventory levels. Ultimately, it is the end use of an inventory that delineates the inventory level, which in turn determines the minimum requirements needed in the QA program, for staffing assignments, and for documentation and reporting.

A SIP emissions inventory is considered by EIIP to be a Level II inventory because it will provide supportive data for strategic decisions making. Although the requirements for a Level II inventory are less stringent than those for a Level I inventory (which will be used to support enforcement, compliance, or litigation activities), the minimum elements required for QA and technical work plans are identical. These elements are reflected in this model QA plan.

As discussed in other chapters of the QA procedures volume, there is flexibility in selecting preferred or alternative staffing options, developing separate or combined QA and technical work plans, and delineating activities that will be part of the QA/Quality Control (QC) program. Because of this flexibility, the model QA plan presented in this chapter should not be viewed as a template that must be strictly followed by a state agency preparing an ozone nonattainment area emissions inventory. The level of detail presented in this QA plan and level of effort described in the QA/QC program may vary in a state's actual QA plan, and the plan would still be acceptable to the U.S. Environmental Protection Agency.

For example, in preparing the point source emissions inventory for Ozoneville, the model QA plan states that the Inventory Development Team will send the permit branch's emissions data to each permitted facility for verification. An option would be to send the emissions data only to facilities that have been flagged by the enforcement branch as having potential problems.

While this model QA plan may appear to provide an unattainable QA/QC goal for a SIP emissions inventory, it can serve as the basis from which a hierarchy of procedures and methods can be developed. An agency can identify their most critical inventory needs, and focus their resources in these areas. QA/QC activities listed in this model QA plan can then be selected on the basis of these priorities.

1996 OZONE NONATTAINMENT AREA
STATE IMPLEMENTATION PLAN EMISSION INVENTORY

QUALITY ASSURANCE PLAN

Prepared By:

Ozoneville Department of Environmental Quality

November 1996

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1.0 INTRODUCTION

1.1 Purpose of Inventory

The 1996 Ozone Nonattainment Area State Implementation Plan (SIP) emissions inventory is being developed in response to requirements specified in the Clean Air Act Amendments of 1990. The inventory addresses volatile organic compounds (VOCs), carbon monoxide (CO), and oxides of nitrogen (NO_x) from point, area, and mobile emission sources. Emissions of VOCs are also addressed for biogenic sources.

The area covered by the inventory includes the Ozoneville Metropolitan Statistical Area (MSA), which was designated by the U.S. Environmental Protection Agency (U.S. EPA) as a serious nonattainment area for ozone. The geographical area delineated by the MSA is shown on the map in Figure 1-1. The map shows the area boundary that was established to avoid unnecessary judgment calls pertaining to the precise location of particular facilities in relation to the MSA borders.

In addition to the regulatory requirements specified by the U.S. EPA, this periodic inventory is being developed to meet the following objectives:

- Determine trends in emission levels, both historically and prospectively;
- Track the 3 percent annual emission reduction requirement for nonattainment pollutants;
- Develop and evaluate air quality-related indicators for measuring progress in attaining ambient standards; and
- Determine the effect of transportation and other control measures on the region's emissions.

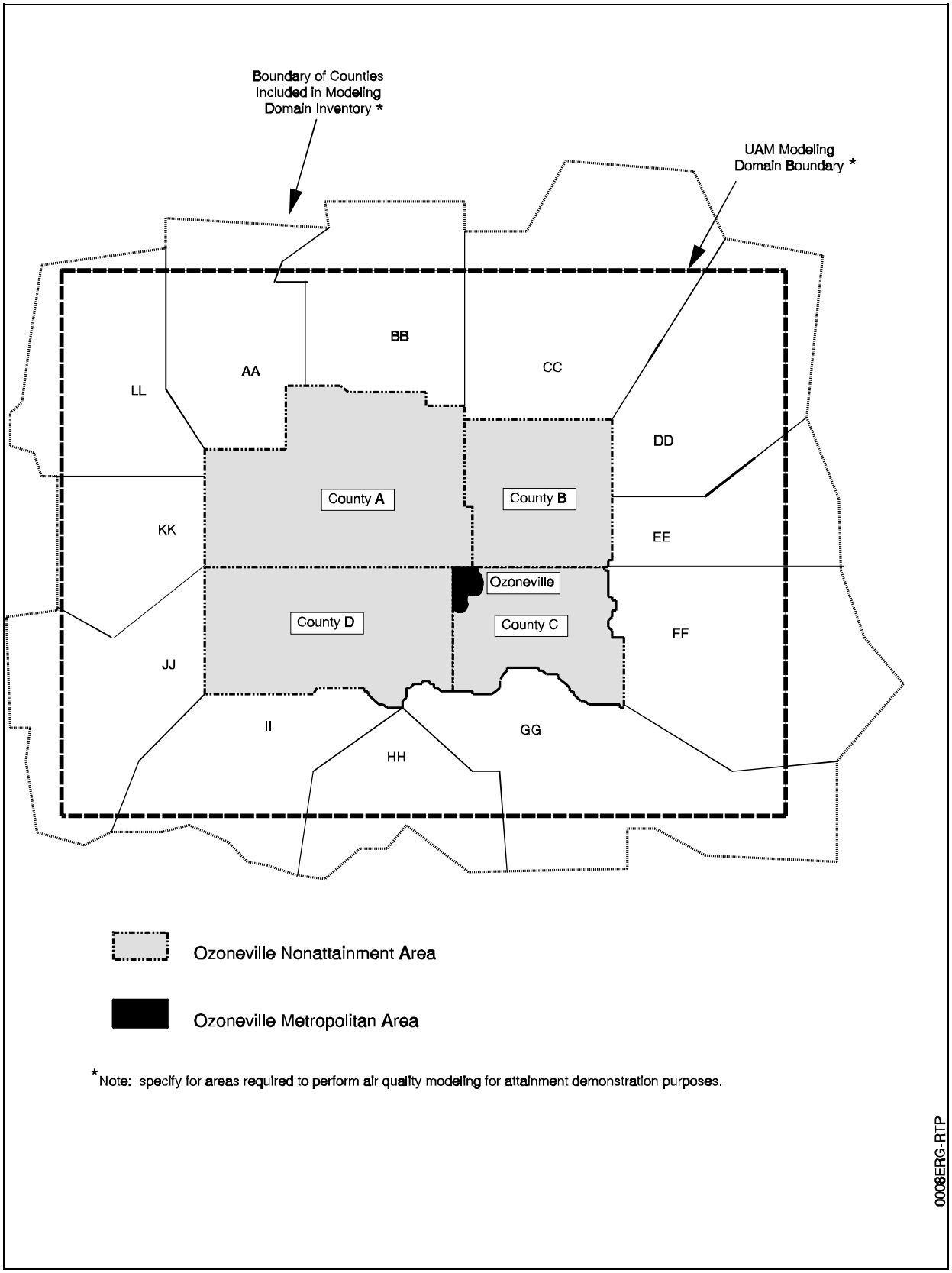

Figure 1-1. Area Map for the Ozoneville MSA Emissions Inventory - 1996

1.2 Data Quality Objectives and Indicators

The 1996 Ozone Nonattainment Area SIP emission inventory for Ozoneville is considered a Level II inventory, based on guidance provided by the Emission Inventory Improvement Program (EIIP) (EIIP, 1996). It is a Level II inventory because it will provide supportive data for strategic decision making. The end use of this inventory, therefore, drives the minimum QA and work plan requirements.

As shown in Table 1-1, data quality objectives (DQOS) were established to help ensure the accuracy, completeness, representativeness, and comparability of the inventory, in keeping with the EIIP's guidance for Level II inventories.

Table 1-2 presents the data quality indicators (DQIs) that will be used to measure progress towards each DQO. The Data Attribute Rating System (DARS) will be used to verify the desired inventory accuracy DQO.

1.3 Summary of Quality Assurance Plan Organization

The remainder of this quality assurance plan (QAP) is organized as follows: Section 2.0 contains the program summary that describes the major components of the inventory development and QA/Quality Control (QC) program; Section 3.0 presents the purpose and policy statement. Section 4.0 contains the emissions inventory preparation plan, which contains details on the organizational structure, roles, and training of inventory development and QA/QC team members. Section 5.0 discusses QA/QC procedures that will be implemented throughout the project, and Section 6.0 describes the corrective action mechanisms that will be implemented as needed. Sections 7.0 through 10.0 discuss the methods that will be used to prepare the point, area, onroad mobile, nonroad mobile, and biogenic source inventories, as well as planned QA/QC activities for each source category. Section 11.0 presents the data reporting procedures that will be followed, and Section 12.0 presents reference citations for all data sources discussed in this QAP.

TABLE 1-1. DATA QUALITY OBJECTIVES

Data Quality Objective	Procedure for Achieving Objective
Accuracy	For point and onroad mobile sources, 100% of the calculations will be checked by the data generator, and 20% of the calculations will be checked by another equally qualified inventory development team (IDT) member. For area, nonroad mobile, and biogenic sources, 100% of the calculations will be checked by the data generator, and 10% of the calculations will be checked by another equally qualified IDT member. In all cases, the data validator will develop a written summary of his or her activities, and will conduct follow-up activities to ensure that data are corrected as needed. If more than 5% of the calculations checked by an equally qualified IDT member need to be revised, then 100% of the calculations will be checked.
Completeness	Extensive planning will be conducted prior to data collection to identify all applicable emission sources. After identifying these sources, the goal will be to determine 100% of the emissions from the largest emitting sources from each source category and as many of the minor sources as possible within the time frame allotted for the work. Those sources identified but not included in the inventory will be identified in the data file and final report.
Representativeness	Senior technical personnel will review all of the primary source data and compare it to previous emissions results and similar results from comparable regions to determine the reasonableness of the emissions estimates and representativeness of the data.
Comparability	To ensure that the data are comparable, standard procedures will be followed and results will be presented in the same units that were used in the 1993 inventory. If a new or improved emission estimation method is used, the 1993 estimate will be recalculated or adjusted to ensure comparability.

TABLE 1-2. DATA QUALITY INDICATORS

DQO	Inventory DQI Target Values
Accuracy	• Achieve DARS score ≥0.7 for all area sources contributing >10% of total emissions of VOCs or NO_x. • Achieve DARS score ≥0.8 for all point sources ≥100 tons per year (tpy). • Achieve DARS score ≥0.7 for onroad mobile source inventory. • Achieve DARS score of ≥0.5 for nonroad mobile source inventory.
Completeness	• 100% of all point sources ≥100 tpy. • 90% of all other point sources. • Top 15 area sources listed in 1990 base year SIP inventory.
Representativeness	• Counties A, B, C, and D. • 1996 daily ozone season.
Comparability	• Results to be compared to 1993 inventory.

2.0 PROGRAM SUMMARY

This QAP provides written instructions for the technical and quality aspects associated with development of the 1996 Ozoneville emissions inventory. It is designed so that QA/QC procedures are implemented throughout the whole inventory development process. This will ensure that the inventory is as complete as possible, accurate, comparable, and representative of the MSA. Personnel involved with the inventory and their responsibilities are discussed in Section 4.0.

2.1 Major Program Components

Inventory tasks and QC procedures will include data checking by the inventory development team (IDT) throughout the development of the inventory and final emission report. These procedures include, but are not limited to, the following:

- The development and implementation of written procedures for data gathering, data assessment, data handling, calculation of emissions, and reporting;
- Adequate management and supervision of the work;
- Review of all calculations for technical soundness and accuracy, including verification that the appropriate emission factors were used and the impacts of controls were correctly addressed;
- Correct assignment of source category codes;
- Assignment of DARS scores;
- Use of technically sound approaches when developing results based on engineering judgment;
- Documentation of the data in a manner that will allow reconstruction of all inventory development activities; and
- Maintenance of an orderly master file of all the data gathered and a copy-ready version of the final inventory submitted to the U.S. EPA.

QA activities are distinguished from QC activities in that they provide a more objective assessment of data quality because QA personnel are not directly involved in the development of the inventory. QA activities are usually more comprehensive because they include assessments of the effectiveness and appropriateness of the systems established by management to control data quality.

The QA program is equal in importance to inventory development and QC procedures, and includes a series of well-planned audits and training sessions that will be conducted by a trained QA staff. QA staff will not be involved in the development of the emission inventory in order to provide an objective assessment of the quality of the work and data.

The value of the QA program is that it highlights the effectiveness of the inventory development program. It can identify points in the process that require improvements in quality in a timely manner.

Audits will be conducted during the collection of the data, calculation of emissions, and development of the final report to determine whether QC requirements specified in this QAP are met. The audit schedule includes quality evaluations at critical points in the inventory development process where data quality could be compromised. The QA Coordinator is also authorized to conduct additional audits, if needed, to ensure that corrective actions are implemented as planned and the work is progressing according to the proposed schedule. The critical phases of the inventory development process and points at which data quality and technical systems audits will be conducted are identified in Figure 2-1. The audit schedule, the identities of the QA auditors, and estimated level of effort for each audit are provided in Figure 2-2.

QA training will be conducted to ensure that the IDT is aware of the quality issues of concern and expectations of the auditors. This training will include an overview of QC requirements and items on the audit checklist. Training will also be conducted to improve compliance with QA/QC requirements, as needed.

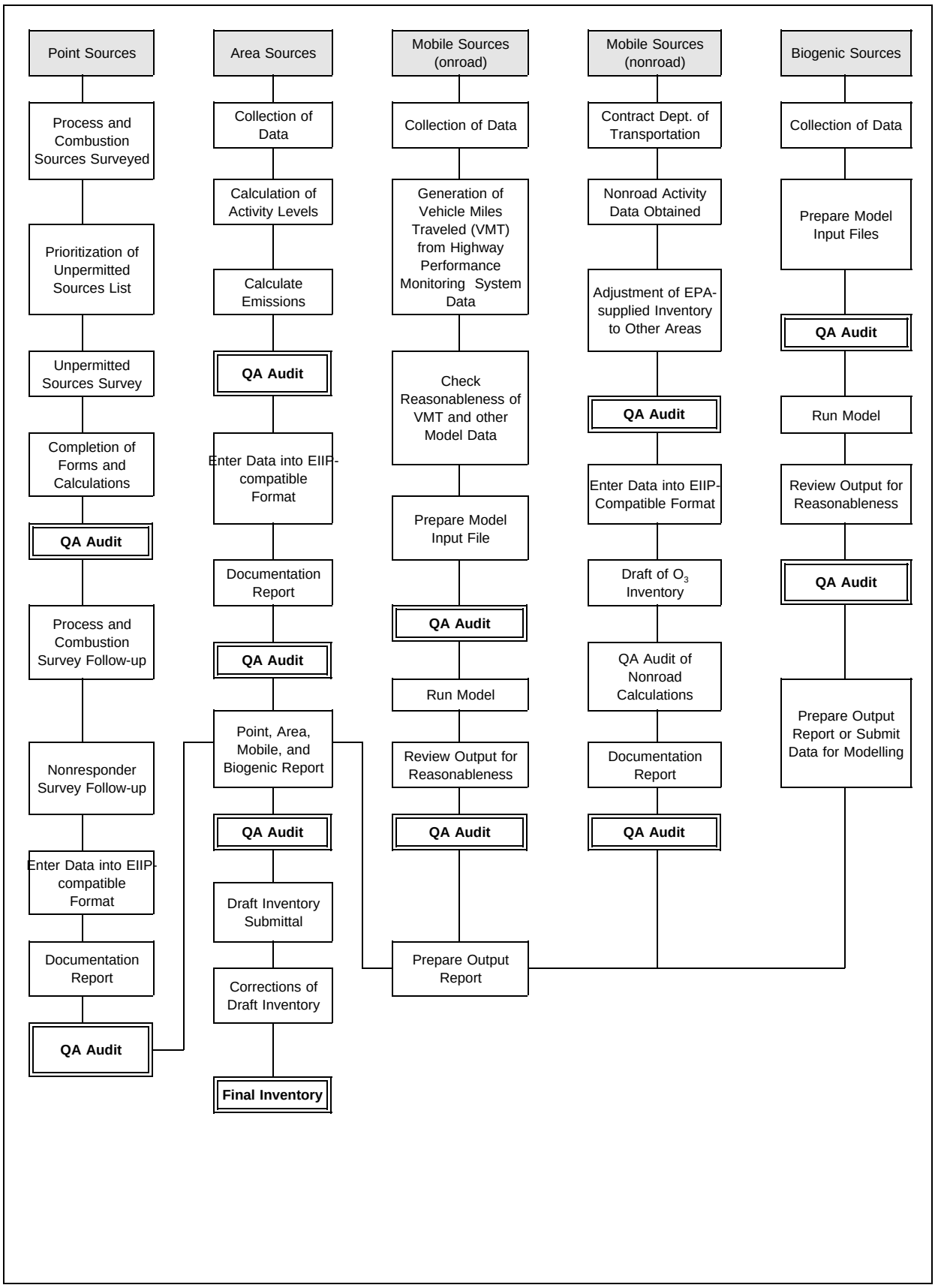

Figure 2-1. Inventory Development Process and Identification of QA Checkpoints

Date*	Audit Type	Objective of Audit	Auditor	Estimated Level of Effort (Hours)
March	Technical Systems Audit	Evaluate data documentation and data file maintenance procedures; supervise activities; train personnel.	S. Carr	36
May	Data Quality Audit	Determine accuracy of sets of area, point, mobile, and biogenic data entry into spreadsheets and emission calculations.	G. Marts	≤8
July	Technical Systems Audit	Evaluate adequacy of computer system: accessibility, memory capacity, ease of use, response time, etc.	S. Carr	24
August	Technical Systems Audit	Evaluate effectiveness of data review and corrective action process; check documentation of reviews, corrective actions, and follow-up activities.	G. Marts	12
October	Data Quality Audit	Determine accuracy of sets of area, point, mobile and biogenic data entry into spreadsheets and emission calculations.	S. Carr	≤8
November	Data/Report Audit	Verify accuracy of emission results included in draft report and compliance to reporting requirements.	G. Marts	24
December	Data/Report Audit	Check accuracy of at least 20% of the emission results included on each page of the report; check completeness of data file.	S. Carr	12

*Note: The schedule will be revised, as needed, to include critical phases of inventory development for each source type (point, area, mobile, and biogenic).

Figure 2-2. Ozoneville MSA 1996 Emissions Inventory Audit Schedule

2.2 Inventory Constraints

The QA Coordinator and Inventory Development Manager have been made aware of several constraints that will impact the inventory development process. The primary constraints are the availability of adequate state funds, inadequacies in the state's computer system, and limited access to the state's computer system. In response, the QA Coordinator has made the Director of the Ozoneville Department of Environmental Quality (ODEQ) and the Inventory Development Manager aware of the following impacts that these constraints could have on the DQOs and deadline for completing the inventory:

(1) Limited funds could mean that the resources required are not available to complete the inventory by the deadline and meet the data quality goals. Additional personnel recommended to complete the inventory on time and within budget cannot be hired.

(2) The computer system deficiencies identified during a previous audit cannot be improved at this time. (See previous audit finding on recommendation for corrective action form included as Figure 2-3.) The computer system currently used by the state does not have sufficient memory to handle some of the emissions programs designed to perform calculations and manage the data. This could potentially affect the accuracy and completeness of the inventory because the computer will not be used exclusively to manage the data, perform routine data searches, and calculate emissions.

(3) Limited access to the computer system also may mean that many calculations, data evaluations, and data searches will have to be conducted manually. Consequently, there is a higher risk of human error and it will take longer to complete the inventory.

Table 2-1 summarizes the possible impacts that these constraints may have on the inventory development process as well as the deadline for submitting the inventory to the U.S. EPA.

The U.S. EPA has been made aware of these constraints and the need for additional funds. The QA Coordinator has designed a QA program to minimize the negative impacts that these constraints could have on the quality of the data. The program includes modification of the QA/QC approach and procedures to include the following:

RECOMMENDATION FOR CORRECTIVE ACTION

A. Initial Information

RCA NO: 0001	DATE: 9/2/93	URGENCY LEVEL 1,2
ORIGINATOR: Steve Carr	APPROVED BY: NHD	1. Potential for major revisions needed. 2. Potential for failure to achieve data quality objective. 3. Suggested improvement.
ORGANIZATION/INDIVIDUAL RESPONSIBLE FOR ACTION: ODEQ, Dave Jones		

B. Problem Identification

SITE/LAB: Agency Office (DEQ)	SYSTEM: Computer Support	DATE PROBLEM IDENTIFIED: 9/1/93

DESCRIPTION OF PROBLEM:

The computer system does not have enough memory to store emissions data and calculate emissions results. The response time is also very slow. Therefore, time is wasted waiting for the system to respond to commands.

C. Recommended Corrective Action

DESCRIPTION:	IMPLEMENT BY:

Provide sufficient memory and improve the response time of the computer system to allow the users to use the system to calculate emissions and manage the data in an effective manner.

D. Problem Resolution

PLANNED CORRECTIVE ACTION:	PROPOSED BY: Jim Hall, Monica White, D. Jones	DATE PROPOSED: 9/15/93	SCHEDULE IMPLEMENTATION: 2/15/94

The computer system will be upgraded to provide sufficient memory to manage the emission inventory data and calculate emissions results. This upgrade will also improve the response time.

IMPLEMENTED CORRECTIVE ACTIONS:	DATE IMPLEMENTED:

E. QA Verification

VERIFIED BY:	DATE:	COMMENTS:

Figure 2-3. Recommendation for Corrective Action Form

TABLE 2-1. POSSIBLE EFFECT OF CONSTRAINTS ON OZONEVILLE MSA 1996 EMISSIONS INVENTORY

Identification of Constraint	Impact on Inventory			
	Not Representative	Incomplete	Less Accurate	Deadline Not Met
Insufficient Funds	✓	✓	✓	✓
Inadequate Computer System		✓	✓	✓
Limited Access to Computer System			✓	✓

- Prioritization of categories so that resources will be allocated preferentially to critical data and sources;
- Additional meetings to discuss the status of the work, results from data reviews/audits, and corrective actions;
- More comprehensive QA audits; and
- Cross training of the IDT.

3.0 PURPOSE AND POLICY STATEMENT FOR THE 1996 OZONEVILLE STATE IMPLEMENTATION PLAN OZONE NONATTAINMENT EMISSIONS INVENTORY

This point, area, mobile, and biogenic emissions inventory is being developed in response to the requirements specified in the Clean Air Act Amendments of 1990 for VOCs, CO, and NO_x emission estimates. Because of the potential usefulness of the information gathered, every effort will be made to generate data that are accurate, representative, and comparable.

In order to provide data of sufficient quality, ODEQ has developed this QAP. It includes all of the critical elements recommended in the U.S. EPA document, *Guidance for the Preparation of Quality Assurance Plans for Ozone/Carbon Monoxide State Implementation Plan Emission Inventories* (U.S. EPA, 1988), as well as guidance provided through the EIIP (EIIP, 1996).

Implementation of the QA and QC procedures described in this QAP is fully supported by the IDT, the Inventory Development Manager, and the QA Coordinator. This support is evidenced by their commitment to implement the procedures as described in this QAP and generate data of known quality.

QC procedures described in this document were developed with the consensus of the QA Coordinator. The procedures were developed to provide a comprehensive program that includes QC measures that are implemented by the IDT, as well as QA measures that are implemented independently by the QA Coordinator and other QA personnel.

It is the responsibility of the IDT to report deviations from the procedures described in the QAP immediately to the Inventory Development Manager and QA Coordinator. The impact of the deviations on the inventories will be evaluated and the appropriate corrective actions will be taken to ensure that the technical and DQOs are met.

The Inventory Development Manager and QA Coordinator have worked with the Air Pollution Control Director and the Director of ODEQ to assure that adequate resources and a sufficient number of trained personnel are provided to meet the objectives of the work and to meet the deadline for submitting the inventory to the U.S. EPA.

Air Pollution Control Director	_____	Date _____
Director of ODEQ	_____	Date _____
Inventory Development Manager	_____	Date _____
QA Coordinator	_____	Date _____

4.0 EMISSIONS INVENTORY PREPARATION PLAN

The organization of the IDT and the QA team results in supervision of all aspects of the inventory development activities and independent QA audits, and establishes a direct line of communication to the State Director of Air Pollution on unresolved QA issues. The organization chart is presented as Figure 4-1. The responsibilities of the key personnel identified on the organization chart are discussed below.

4.1 Managerial Responsibilities

The Air Pollution Control Director, Dr. Mary Clean, will work with the U.S. EPA to obtain additional resources to complete the inventory by the agreed upon deadline. Meetings will be held routinely with the Environmental Quality Department Director, Dave Jones, and the QA Coordinator, Steve Carr, to keep Dr. Clean informed of the status of work. Dr. Clean will also handle any unresolved quality issues that may arise as a result of a QA audit.

Mr. Dave Jones, Director of ODEQ, is ultimately responsible for compliance with the requirements specified in the Clean Air Act Amendments. He has designated the person in the agency who will be responsible for the management of the inventory development activities (the Inventory Development Manager) and will work with the Inventory Development Manager, Air Pollution Control Director, and EPA to provide the resources needed to complete the inventory.

Ms. Monica White, Inventory Development Manager, will plan and manage all inventory development activities. She is responsible for the development of the QAP and final emissions report. Ms. White has assigned the work to four Task Leaders, will inform the ODEQ Director of the need for additional resources, and will routinely hold status meetings with the Task Leaders to keep them informed of the progress of the work and quality concerns. Recommendations for corrective actions will be forwarded to Ms. White for resolution, and she will conduct internal follow-up activities until QA concerns are

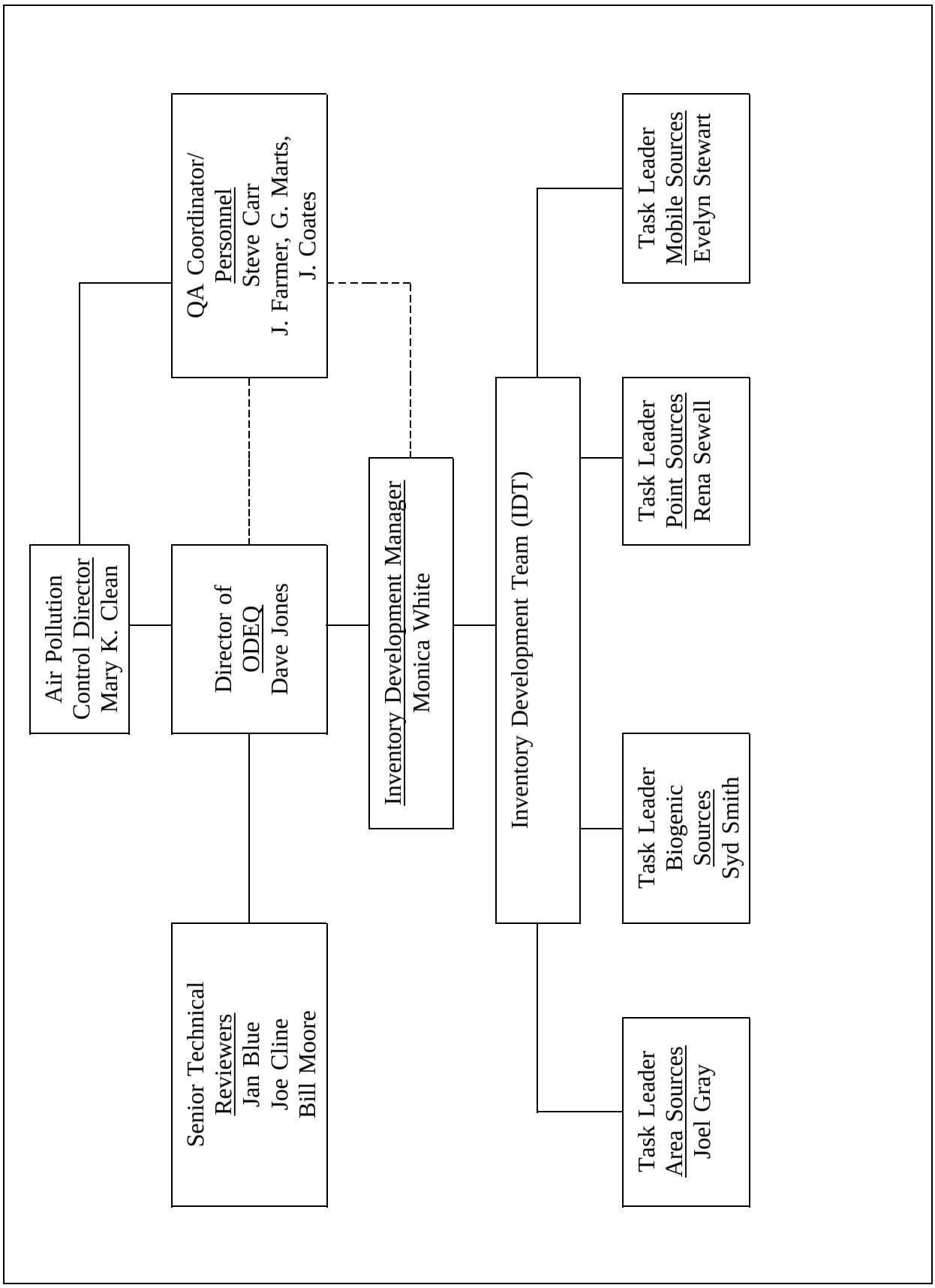

Figure 4-1. Ozoneville MSA 1996 Emission Inventory QA Organization

eliminated. She will provide technical training and meet regularly with the QA Coordinator to discuss any trends that may be obvious from reviewing the audit findings. QC procedures will be revised accordingly to maintain continuous improvement of data quality.

4.2 Inventory Development Task Leaders

The inventory development Task Leaders are Joel Gray, Syd Smith, Rena Sewell, and Evelyn Stewart. They will help plan and conduct the technical aspects of the development of the inventory, supervise daily IDT activities, and help develop the emission inventory report. They will work closely with the IDT to help identify ineffective QC procedures, and, if necessary, make recommendations to the Inventory Development Manager on revisions needed in QC procedures. Task Leaders will also monitor the status of the work, review data calculations, and make arrangements to have the data reviewed by senior technical reviewers.

4.3 Inventory Development Team Members

IDT members report to their respective Task Leaders. They will collect data, calculate emissions, and participate in QC reviews of work completed by other IDT members. Each team member is responsible for maintaining a complete data file and documenting all of their activities in a manner that will allow verification of the emissions reported and source of the supporting data. Team members have been or will be trained by the Task Leaders and the Inventory Development Manager.

4.4 Technical Reviewers

Senior technical reviewers for the inventory are Jan Blue, Joe Cline, and Bill Moore. These reviewers were selected because of their experience collecting emission inventory data and calculating results. Their experience will be used to assess the technical soundness, accuracy, reasonableness, representativeness, completeness, and comparability of

the data. They will summarize the results from their reviews in written reports and inform the Inventory Development Manager of findings that could compromise data quality.

4.5 Quality Assurance Coordinator

The QA Coordinator, Steve Carr, helped develop this QAP. His input ensures that adequate QA/QC procedures are incorporated into the inventory development process. He will conduct QA training and revise the audit schedule as needed so that all critical phases of the inventory development process are audited prior to generation of the emissions report. Steve will routinely attend status meetings held by the Inventory Development Manager and use the information from these meetings to revise the audit schedule, when appropriate, to ensure that the audit objectives are met.

The QA Coordinator will categorize and use the audit findings to evaluate the effectiveness of QC measures and QA audits. The QA/QC program will be revised to address trends that suggest that the technical and data quality objectives are not being achieved.

A summary of the QA Coordinator's responsibilities and activities follows and will be to:

- Help develop the QAP;
- Develop the audit checklists and audit schedule;
- Provide QA training to inventory development and QA personnel;
- Attend inventory development status meetings;
- Schedule audits, conduct audits, and report findings;
- Evaluate audit findings to determine if trends exist, and keep management informed of the results;
- Follow up on recommendations for corrective actions;

- Keep the Inventory Development Manager, Environmental Quality Department Director, and Air Pollution Control Director informed of the audit results;

- Work with the Air Pollution Control Director to resolve any quality concerns that cannot be resolved at the inventory management level; and

- Maintain a file of audit findings and corresponding corrective actions.

The QA Coordinator reports directly to the Air Pollution Control Director and indirectly to the managers overseeing development of the inventory. These reporting lines will help provide an objective approach to implementation of the QA program and reporting of quality issues.

QA personnel assisting the QA Coordinator may be employees of ODEQ who are also not actively involved in the development of the inventory, and have the technical experience to evaluate the technical soundness of the data and inventory development systems. However, the QA Coordinator is ultimately responsible for implementing the audit program, reporting audit findings, and conducting follow-up activities.

5.0 GENERAL QA/QC PROCEDURES

QA/QC procedures described in this QAP were developed to help ensure data accuracy, completeness, representativeness, and comparability. These procedures have been incorporated in the technical procedures, where applicable, and will be implemented by the IDT throughout the planning, data collection, emission estimation, and reporting phases of the inventory development program.

5.1 QC Activities

QC procedures will be implemented by the IDT during inventory development to meet the technical and DQOs. These activities will be conducted at critical steps in the inventory development process where the successful outcome of inventory development could be compromised. These critical steps are presented below and discussed in the following subsections of this QAP:

- Data gathering;
- Data documentation;
- Calculating emissions;
- Data checking and DARS scoring;
- Reporting; and
- Maintenance of the master file.

5.1.1 Data Gathering

Data gathering will be conducted according to U.S. EPA-approved procedures. The approach and supporting documents or references will be thoroughly documented and included in the emissions report.

The documents identified in Table 5-1 will be used to determine the best data-gathering approach for each emissions source type. Some data sources identified in these documents are also listed in Table 5-1. All data sources will be thoroughly documented in bound notebooks by the IDT. The IDT will also document when required data needed for specific source categories cannot be obtained or do not apply. The reason for not including a source or source category in the inventory will be clearly explained in the documentation.

TABLE 5-1. DATA COLLECTION GUIDANCE DOCUMENTS

Source Type	Guidance Document	Suggested Data Sources
Point	EPA-450/4-91-016 AP-42 EIIP Volume II	Existing inventories, state permit files, facility surveys, county business directories, telephone directory
Area	EPA-450/4-91-016 EIIP Volume III	Existing inventories, example cases, and data sources
Nonroad Mobile	EPA-450/4-81-026d	Existing inventories, example cases, and data source
Onroad Mobile	EPA-450/4-91-010 EPA-450/4-91-011 EIIP Volume IV	Transportation or planning agency data
Biogenic	EPA-450/4-91-010 EIIP Volume V	Crop acreage and land use; meteorological data by county

5.1.2 Data Documentation

Previous audit findings and comments from data reviewers have helped to emphasize the need for good data documentation procedures when developing an emissions inventory. Therefore, data documentation requirements have been developed for the IDT to facilitate the validation of the final emissions results. The documentation requirements will help ensure that all data needed for the emissions final report are gathered, maintained, and retained in the master file.

All activities conducted by the IDT on a daily basis will be documented in bound notebooks with indices to facilitate the retrieval of recorded information. A notebook will be assigned to each team member and it will only be used to record information relative to the development of the inventory. This daily log of activities will help another IDT member reproduce the emission results and allow an evaluation of data accuracy and completeness.

The following procedures are to be followed when documenting data in the notebooks:

- Data will be recorded legibly and in black ink;
- Entries will be corrected by drawing a single line through the data and writing the correct data above or below the correction (with initials, date, and explanation of corrections to allow reconstruction of the work);
- Complete descriptions of all data sources will be included (references to be included in final inventory report);
- Units of measurement will be provided with each data value;
- An explanation will be provided for emission sources that are omitted from the final inventory (justification required in report);
- The procedures used to calculate emissions will be described and example calculations will be provided;
- The approach used to determine completeness for each source type will be described;
- Documents from which emission factors are taken will be identified and referenced; and
- The source, agency, group, or company providing information by telephone will be identified (include telephone number and date information was provided).

Worksheets and contact reports may also be used to maintain records of data sources or calculations; however, the same guidelines must be followed when recording

information on them. A file will be developed specifically for these forms to ensure that they are retained and are easily located when the data are needed to calculate emissions. The contact report form that will be used is shown in Figure 5-1.

All worksheets, electronic spreadsheets, and notebooks will be reviewed periodically by the inventory development task leaders to determine whether the procedures described above are being followed. This review should be evidenced by a dated signature on the notebook pages or worksheets reviewed (i.e., reviewed by _____ on _____.)

Examples of acceptable documentation practices for each source type are included in the next section of this QAP.

5.1.3 Calculating Emissions

Information on how point, area, mobile, and biogenic emissions will be calculated is provided in Sections 7.0 through 10.0.

5.1.4 Data Checking and DARS Scoring

Data checking by the IDT is used to ensure data accuracy. Data will be checked at logical steps in the development of the inventory where transcription or calculation errors are likely to be found. Data checking will also be used to assess the technical soundness of the data. QA checkpoints are depicted in Figure 2-1.

Although different types of data will be reviewed at each checkpoint, the type of review may also vary. For example, when a document containing information is first received and logged in, it will first be checked to see if it was generated in the correct year and is for the correct location. Later, as data are used in calculating emissions, checking will include evaluations of data accuracy, reasonableness, and completeness.

CONTACT REPORT

Date _____ Originator _____

CONTACT BY: TELEPHONE ___ MEETING ___ OTHER _____

NAME, TITLE, & ORGANIZATION
ADDRESS & TELEPHONE NUMBER
PURPOSE OR SUBJECT (Give project number if appropriate)

SUMMARY:

ACTION:

Figure 5-1. Contact Report

The most logical checkpoints for each review are after data entry and calculations are performed. Data can be checked by another IDT member, by the Task Leader, or a senior technical reviewer (see Figure 4-1). If errors are found during these reviews, the person generating the data and reviewer must agree on the corrective action to be taken and see to it that the error is eliminated. They must also determine the impact, if any, that the error will have on other relevant data, and revise the affected data accordingly.

The results from data checking will be documented to further qualify the emissions estimates. In addition to the DARS scores assigned, the number of data points checked assists reviewers in evaluating the accuracy of the completed emissions report. Documentation of DARS scoring and data checking should include descriptions of the rationale for scoring, the data checked, and the dated signature of the reviewer. Figure 5-2 presents an example area source form that will be used to document the data checked and the findings.

5.1.5 Reporting

The emissions inventory report will be formatted according to the instructions provided by the U.S. EPA. Prior to finalizing the report, all of the actions taken in response to the recommendations for corrective actions will be evaluated to determine whether the report accurately reflects the corrections made. The report will be reviewed for technical soundness, completeness, accuracy, comparability, and representativeness by senior technical reviewers, editors, and QA Personnel.

It is the responsibility of the Inventory Development Manager to ensure that the report accurately reflects the data and that the master file provides sufficient data to verify the results reported. A copy-ready master of the report will be retained in the master file and made available to all project personnel.

CATEGORY DESCRIPTION:

SOURCE CODE:

INVENTORY REGIONS COVERED:

NAME (person responsible for calculations):

SIGNATURE (QC Review 1) _____ DATE _____

IS SECOND QC REVIEW NEEDED (YES/NO)? _____

SIGNATURE (QC Review 2) _____ DATE _____

SIGNATURE (QA Review) _____ DATE _____

Checklist	QC1	QC2	QA
1. Were all emission factor sources clearly referenced?			
2. Were correct emission factors used?			
3. Were sources of activity data clearly referenced?			
4. Were correct activity data used?			
5. Were the correct seasonal adjustment factors (SAFs) and activity days per week used?			
6. Were all calculations documented?			
7. Are calculations correct?			
8. Were applicable regulations cited?			
If so, were rule effectiveness (RE) and rule penetration (RP) correctly applied?			
9. Were nonreactive VOCs excluded?			

Figure 5-2. Area Source Category QA/QC Checklist

The following problems need to be corrected (indicate whether QC1, QC2, or QA and sign):

Figure 5-2. (Continued)

5.1.6 Maintenance of the Master File

The master file is a compilation of all data gathered and produced during development of the inventory. It should include sufficient supporting data to verify the accuracy of the emissions results reported. Indexing procedures must facilitate data retrieval.

Maintenance of the master file will begin with retention of this QAP. All correspondence and data received concerning development of the inventory will be filed by source and county. References will be maintained, along with applicable data contained within each reference.

The master file will be maintained by one of the IDT members or an administrative assistant. Access to the file will be limited to the IDT and controlled so that it is maintained in an orderly manner and is complete. A sign-out sheet will be used and is shown in Figure 5-3. A log will also be used to document data receipt and retrieval. File identification numbers will be assigned to the data and used to facilitate retrieval.

Copies of pertinent data will be made to provide working copies for the IDT; however, the original documents will remain in the master file.

5.2 QA Activities

QA activities are distinguished from QC activities in that they provide a more objective assessment of data quality because QA personnel are not directly involved in the development of the inventory. QA activities are usually more comprehensive because they include assessments of the effectiveness and appropriateness of the systems established by management to control data quality. This includes evaluations of the management and supervision of the work.

File Number	Check Out		Check In	
	Date	Initials	Date	Initials

Figure 5-3. Master File Sign-Out Sheet

QA activities will include QA training and the conduct of a series of independent audits to assess the effectiveness of the entire QC system and management of inventory development activities. These activities will be conducted by the QA Coordinator and other adequately trained personnel who are not involved in the inventory development process.

5.2.1 Training/Education

Initial training sessions will be conducted to discuss the items on the audit checklist and QA/QC requirements specified in this document. The QA Coordinator will conduct additional training when audits reveal the need for more QC measures or revision of existing procedures.

Occurrences that may lead to additional QA training include the following:

- An audit reveals a lack of understanding of QA/QC requirements or the need to develop additional QC measures.
- An audit reveals the need to provide guidance on acceptable data handling procedures because data are not maintained in a manner that allows easy verification of the accuracy of emission results and source of the supporting data.
- An audit reveals unacceptable data documentation practices that lead to entry errors and an inability to recreate emission results.
- An audit reveals that the internal data reviews do not adequately control data entry and calculation errors.
- The Inventory Development Manager requests QA training for new IDT members.

The QA Coordinator will conduct the training and maintain records of each training session.

5.2.2 Audits

Audits will be conducted according to the schedule presented in Figure 2-2. They will include assessments as the inventory development process is being planned, during data collection, as emissions are being calculated, and when the results are reported. The primary goal of the audit program is to prevent quality concerns. Opportunities to incorporate preventive measures will be included during each audit.

Prior to announced audits, the auditor will inform the persons to be interviewed of the date and time of the audit and data/systems to be reviewed. All of the personnel involved in inventory activities being audited will be asked to be available to respond to questions about their duties. The responses will then be compared to the requirements specified in this document and other referenced documents to determine compliance with approved procedures.

Questions that will be asked by the auditor and data to be evaluated during the audits vary by source type. The QA Coordinator will use the results of previous audits and work with Inventory Development Manager to develop source-specific audit checklists. Example checklists for technical systems and data audits are provided in Appendices A, B, and C. After developing the checklists, QA training will be held to inform the IDT of the steps in the inventory development process that are considered to be of concern. These meetings will be used to increase the team's awareness of the points in the inventory development process that may require more QC and managerial oversight.

Data audits will be conducted after major data transcriptions and calculations. The auditor will evaluate consistency in data entry and manipulation between IDT members. The results from the audits will be immediately shared with the data generator, Task Leader(s), and Inventory Development Manager. IDT members involved in the audit will be asked to respond immediately to the findings that will be informally discussed after the audit.

In addition to data quality audits, systems audits will be conducted to determine whether the procedures used are effective to collect data, document inventory development activities, and maintain the data. Systems audits will also include assessments of the supervision of the work and review of the data by the senior technical reviewers. These systems audits are used to evaluate the need to revise or develop additional procedures.

As the audits are conducted, the auditors will also assess how well the IDT is meeting the DQOs. Audit findings that reveal any compromises in data integrity or identify something that interferes with the achievement of these objectives will be brought immediately to the attention of the Task Leader and Inventory Development Manager. Solutions will be found for the problems identified, and the actions taken will be monitored until the quality issues are resolved.

5.2.3 Reporting Audit Findings

Audit findings will be documented on the audit checklist. The audit checklist and notes will be used to summarize the preliminary findings for the IDT, Task Leaders, and Inventory Development Manager after the audit. The checklist and notes will also be used to develop the audit report, which will be included in the QA documentation section in the inventory report.

The audit report will describe each deviation from approved procedures or finding that could compromise the successful outcome of the inventory. Documentation of each finding will include a description of the action or data reviewed that led to the quality concern and recommendation for corrective action.

The audit report will at least include the following information:

- Name of auditor, Inventory Development Manager, and IDT members audited;

- Audit date;
- Audit type;
- Audit objectives;
- Audit findings; and
- Recommendations for corrective actions.

Audit reports will be distributed within two weeks of the conduct of each audit to the persons interviewed, Task Leaders, and Inventory Development Manager. A summary of the types of quality concerns found will be periodically forwarded to the ODEQ Director to keep him informed of the quality issues found and actions being taken to resolve them. Audit reports will be retained in a QA file and used to conduct subsequent audits and plan follow-up activities.

6.0 CORRECTIVE ACTION MECHANISMS

Recommendations for corrective actions are made as quality concerns are identified. Recommendations for corrective actions will be formally presented in the audit reports. The corrective action form included as Figure 2-3 will be used to document the findings and actions implemented in response to each recommendation for corrective action. Original forms will be retained in the audit file, and copies will be distributed to the Task Leaders and the Inventory Development Manager. The information on the corrective action forms will be used by the auditor to monitor the types of problems found and the phases of the inventory development process that may need additional QC to eliminate recurring quality concerns.

The urgency of the responses is determined by the category of the finding. The categories are:

Priority 1: Potential for major revisions needed;

Priority 2: Potential for failure to achieve DQOs; and

Priority 3: Suggested improvements.

Priority 1 and 2 findings will be immediately brought to the attention of upper management and the planned implementation dates for the corrective actions will be as soon as possible after the audit. The Task Leader and Inventory Development Manager will meet routinely with the QA Coordinator to discuss the actions taken in response to the recommendations for corrective actions for Priority 1 and 2 findings until the quality concerns are resolved. The planned implementation date for Priority 3 findings may be later than the dates proposed for implementing actions taken in response to Priority 1 and 2 findings.

Follow-up activities will be conducted as frequently as required by the Task Leader and auditors to determine whether the recommended actions are taken. Each effort to

assess the implementation of the corrective action will be documented and maintained by the QA Coordinator in an audit file established for these records.

Follow-up activities could include the conduct of additional audits or informal assessments of the data or system of concern. The type of reevaluation will be determined by considering the impact that the quality concern could have on the technical and DQOs.

7.0 POINT SOURCE INVENTORY PREPARATION AND QA/QC ACTIVITIES

For the purposes of this emissions inventory, point sources are defined as stationary, commercial, government, and industrial operations that emit more than 10 tpy of VOCs or 100 tpy or more of NO_x or CO. Point source data will be collected from two basic sources:

- The permitted sources database, and
- The small point sources database.

The latter was developed initially in 1992 by ODEQ for preparing the 1990 Base Year Inventory. It is updated every three years. The last update was completed in 1995 (the 1993 Periodic Inventory). Previous inventories included all sources not included in the permitted sources database.

The permitted sources database is maintained by ODEQ's Permits Branch. All facilities that have been issued permits are required to submit a comprehensive annual inventory that includes emissions from permitted as well as insignificant sources. However, exempt sources (e.g., wastewater treatment, housekeeping activities, on-site mobile sources)[1] are not included; exempt emission sources will be covered in the 1996 inventory as area, nonroad, or onroad mobile sources. The Permits Branch conducts a review of each facility inventory received, including checking for completeness, verifying emission factors, performing sample calculations of emissions from larger sources, and performing reasonableness checks of emissions and throughput values. Each facility is asked to verify questionable data to correct any errors. Inspectors within the Permits Branch continually check for new businesses and industries, as well as ones that have been closed recently. Their database, therefore, accurately reflects the 1996 operations of each permitted facility.

[1] The Permits Branch is currently evaluating the feasibility of requiring that facilities include these sources in their annual inventories.

ODEQ has found that this database is generally adequately reviewed for completeness, accuracy, and reasonableness. However, additional reviews will be conducted before it is used in the ozone nonattainment point source inventory:

- Records from ODEQ's Enforcement Branch will be reviewed to determine if facility inspections have identified any emission estimation inconsistencies; and
- The database will be reviewed to determine if any emission source data are missing or out-of-date.

The data for each facility will be printed (Facility Report 1) and sent to the contact listed in the database. The facility contact will be given 60 days to review the data, make any needed updates, and return the Facility Report to ODEQ. Follow-up calls will be made to resolve any issues found in the additional reviews described above.

After 90 days, the list of facilities that have not responded to the request for information will be prioritized by size. Calls will be made to as many facilities as possible to determine why the forms were not returned. Each call will be documented using the Contact Report form (Figure 5-1).

A similar procedure will be followed for the small point sources database. To identify any new sources that need to be added, the following will be checked:

- Construction permit records for 1993 to 1996 (for commercial or industrial properties);
- State employment data for 1993 to 1996; and
- Dun & Bradstreet and other listings of businesses in the Ozoneville MSA.

The lists generated from follow-up on the two databases will then be cross-checked with the existing list of unpermitted facilities. Any new source with a

commercial or industrial Standard Industrial Classification (SIC) Code will be sent an initial survey (Figure 7-1).[2] The existing sources will be sent a copy of their current data (Facility Report 1) and asked to update the report with new information. The same procedures described above for follow-up will be used.

Data for new sources or updates to existing sources will be entered into the Ozoneville Emissions Modeling System (OEMS). OEMS is an EIIP-compatible data system. For new sources, OEMS data entry forms will be generated by the IDT. Data will be transferred from the reports or forms sent by the facilities to OEMS data entry forms. Each of these forms will be reviewed by the IDT member who generated them and 100 percent of the data elements will be checked. Then, 20 percent of the data elements will be checked by another IDT member. If errors are found, they will be corrected and a second review will be made. This process will be repeated until the data forms are verified to be 100 percent correct. Forms with completed and verified data will then be sent to ODEQ's Data Management Branch for entry into OEMS.

ODEQ aspires to attain an error-free database; however, it will not be possible to perform checks on 100 percent of all the data elements. Furthermore, data updates occur every year in the Permits Branch database, introducing the possibility of new errors.

[2] Figure 7-1 presents an example survey form for stationary combustion sources only.

FORM EI-1 REPORTING YEAR 1996

ODEQ EMISSION INVENTORY QUESTIONNAIRE

STATIONARY COMBUSTION SOURCES

Please complete this form with data representing operations for the calendar year listed above.

BUSINESS NAME _____

BUSINESS ADDRESS _____

REPORTED BY _____

ODEQ FACILITY NUMBER _____ DATE _____

TELEPHONE _____ FAX _____

Company ID Number				
ODEQ Source No. (i.e., B001)				
Type of Fuel Used				
Coal, tons/year				
Ash, % (as fired)				
Oil (indicate type), gal/yr				
Fuel Sulfur Content, % (as fired)				
Gas, Million cubic ft/yr (please report MMCF)*				
Other Fuel (indicate), units/yr				
Fuel Heat Value, Btu/unit (as fired)				
Last Test Date				
% Annual Throughput Each Quarter: January - March				
April - June				
July - September				
October - December				
Operating Schedule: Hours/Day				
Days/Week				
Weeks/Year (or Hours/Year)				
Hours Operated Without Control Equipment				

*** Natural gas usage should be reported in million cubic feet (MMCF). The unit MCF is thousand CF. If billed in units other than MMCF, usage may be reported in those units provided the new units are clearly noted.**

COMMENTS:

Figure 7-1. Point Source Survey Form For Stationary Combustion Sources

8.0 AREA SOURCE INVENTORY PREPARATION AND QA/QC ACTIVITIES

Based on a review of the 1993 periodic inventory, a checklist of area sources has been prepared, evaluated, and prioritized for inclusion in the 1996 ozone nonattainment area SIP inventory. Source categories have been ranked by VOC followed by NO_x emissions to identify the most significant area source categories for inclusion in the inventory. The area sources have been generally grouped from largest to smallest, with priority given to the larger sources. U.S. EPA and EIIP guidance, as well as inventories from two nearby states, were also reviewed to identify sources excluded from the 1993 periodic inventory. Emission estimates will also be developed for 1993 for these two categories for comparability. Two categories were added as a result of this analysis: slash burning and industrial wastewater treatment. Emission estimates will also be developed for 1993 for these two categories for comparability. Two source categories were also eliminated from the 1996 inventory: open burning and on-site incineration. The reasons for excluding these sources will be documented in the inventory report. The list of area sources to be included in the 1996 periodic inventory is summarized in Table 8-1.

Data will be collected by the IDT in the following formats:

(1) Mail and phone surveys. For a limited number of area source categories, data will be collected by means of survey forms mailed to facilities, or used as phone questionnaires by ODEQ personnel.

(2) Reports. Examples are population data from the U.S. Census Bureau, and energy use data from the U.S. Department of Energy and the Ozoneville Energy Office.

(3) Letters and memoranda. In many cases, information will be sent in letters or memoranda, or as database hard-copy reports with a transmittal letter.

(4) By phone or facsimile. Some information will be received over the phone and recorded on telephone contact log sheets; other information will consist of facsimiles showing hand calculations or data inputs. The information received in this manner is likely to come from agencies in ODEQ, other state and local agencies, and federal agencies.

TABLE 8-1. AREA SOURCES TO INCLUDE IN 1996 INVENTORY AND PROPOSED EMISSION ESTIMATION METHOD

Category	Estimation Method
Architectural surface coating	Use results of survey conducted in 1993. Update by resurveying five largest distributors.
Asphalt paving	Use U.S. EPA-recommended emission factor/gallon paving material. Obtain paving data from the state Department of Transportation.
Commercial bakeries	Use U.S. EPA-recommended production-based emission factor. Obtain production data from U.S. Census Bureau.
Consumer/commercial solvent use	Use preferred method in EIIP Volume III, Chapter 5 (EIIP, 1996). Obtain population data from U.S. Census Bureau.
Dry cleaning	Use preferred method in EIIP Volume III, Chapter 4 (EIIP, 1996).
Gasoline distribution	Use preferred method in EIIP Volume III, Chapter 11 (EIIP, 1996). Use MOBILE model to calculate vehicle refueling emission factors (U.S. EPA, 1996a). Information on gasoline dispensing outlets is available from the ODEQ.
Graphic arts	Use alternative method 1 in EIIP Volume III, Chapter 7 (EIIP, 1996). Obtain population data from U.S. Census Bureau.
Industrial surface coating	Conduct survey of facilities with SIC Codes identified by U.S. EPA in the Procedures document as industrial surface coating facilities (U.S. EPA, 1991a). Survey using a two-stage approach: (1) determine proportion of facilities with surface coating activity, and (2) obtain solvent consumption/disposal data from representative sample of applicable sources.
Industrial wastewater treatment	Use Surface Impoundment Modeling System (SIMS) emission estimation model (U.S. EPA, 1990).
Landfills	Use U.S. EPA's Landfill Air Emission Estimation Model (U.S. EPA, 1996b). Obtain activity data from ODEQ's Department of Solid Waste.
Pesticide application	Use alternative method 1 in EIIP Volume III, Chapter 9 (EIIP, 1996).
Slash burning	Use AP-42 emission factors (U.S. EPA, 1995). Obtain activity data from the state Department of Forestry.
Small stationary source fossil fuel combustion (residential, commercial, and industrial)	Use AP-42 emission factors (U.S. EPA, 1995). Obtain activity data from state Energy Office and Energy Information Agency. Apportion fuel consumption data to the county level based on residential population and employment (from U.S. Census Bureau data).
Solvent cleaning	Use preferred method in EIIP Volume III, Chapter 6 (EIIP, 1996).
Structure fires	Use U.S. EPA-recommended emission factors from Procedures document (U.S. EPA, 1991a). Obtain activity data from Ozoneville Fire Marshal.

All data will be retrieved from the appropriate agencies or libraries. Copies of all data, including paper and electronic formats, will be logged in, assigned a file identification number, and filed in the project file. Data sources will be clearly documented in the database and on worksheets.

The quality and completeness of data will be ensured by using the worksheets and completing the QA/QC checklist shown as Figure 5-2. Alternative sources of data will be evaluated; the basis for choosing one data source over another will be clearly documented. QA/QC procedures (if known) used by the agencies or individuals supplying the data will also be documented.

Emissions calculations will require the acquisition of data from a variety of different sources. Preferred data sources are shown in Table 8-1. Any deviations from the methods or data sources shown will be documented and explained. In addition, because improvements will be made to the emission estimates based on EIIP guidance, 1993 estimates will be prepared for any source categories for which revised emission estimation methods are used. The inventory report will also include a discussion of other area source categories for which improved estimation methods are needed.

Calculations will be performed on spreadsheets as much as possible. If handwritten calculations are necessary, they will be recorded and maintained in the project file. Emissions factors for most sources are available from EPA guidance documents; the EIIP area source volume will be the primary reference. Values for seasonal adjustment factors (SAFs) and activity days per week were developed for the 1993 periodic inventory. These values will be verified for applicability before use in this inventory. Emissions will be adjusted (if needed) to exclude nonreactive VOCs. Federal and state regulations will be reviewed to determine which area source categories are affected, particularly those for which rules were promulgated between 1993 and 1996. Rule penetration (RP) and rule effectiveness (RE) adjustments to the emissions will be made where appropriate.

Care will taken to avoid double-counting of emissions. The area source emissions will be adjusted after completion of the point source inventory to account for point source emissions.

All area source calculations will be reviewed as part of the QC program by the inventory developer; 10 percent will be reviewed by another IDT member. The person doing the QC will check data accuracy and the reasonableness of assumptions, and review the calculations. In general, the following considerations will be used to assess the accuracy of all calculations:

- Are the equations used for each method or procedure consistent?
- Are assumptions and engineering judgments documented and reviewed?

Spreadsheet audit functions will be used to verify that spreadsheet functions were used correctly.

If revisions are needed, the person who did the calculations is responsible for making them. If a second QC review is needed, it will be performed. Revisions to the computer files will be indicated on the "DATA LOG SHEET" and current copies of all computer files will be kept in the project file (Figure 8-1).

After emissions are calculated, they will be reviewed by the Task Leader. Outliers will be checked to ensure that the data, data processing, and calculations used are correct and acceptable. It should be noted that simply because the estimate is an outlier, i.e., it does not fall within the expected range, this does not necessarily denote an error. Such outliers will be examined, but additional time will be taken to assess outliers that occur in categories that have large emissions and those that differ greatly from the expected range. If an outlier is identified and the emission methodology and calculations are reasonable, the data will be flagged and appropriate EPA personnel will be contacted for guidance.

DATA LOG SHEET

SOURCE:

SOURCE CODE:

NAME (Person responsible for calculations):

Item	Date Completed	Name of Person Responsible
Calculations		
QC Review (1)		
Revisions		
QC Review (2)		
Data coded for OEMS		
Data entered in OEMS		
OEMS data QA		

Page 1 of 2

Figure 8-1. Area Source Data Log Sheet

DATA LOG SHEET

AREA SOURCE CATEGORY:

SOURCE CODE:

NAME (Person responsible for calculations):

Spreadsheet file names (copy of current versions should be kept in project file):

File Name	Date of Current Version	Contents

Page 2 of 2

Figure 8-1. Continued

When all QC reviews are complete and all necessary revisions have been made, the data will be entered into OEMS. If the data must be hand entered, assistance will be provided by the person who calculated the estimates. This person will also help QC the data after OEMS entry. The data entry personnel are responsible for completing the OEMS-related item in the table on the "DATA LOG SHEET."

9.0 ON- AND NONROAD MOBILE SOURCE INVENTORY PREPARATION AND QA/QC ACTIVITIES

9.1 Onroad Mobile Sources

Onroad mobile emissions will be estimated using emission factors generated from the U.S EPA's MOBILE program and vehicle miles traveled (VMT) data generated primarily from the Highway Performance Monitoring System (HPMS). The Ozoneville nonattainment area encompasses the Federal Aid Urbanized Area (FAUA) and extends beyond it. Therefore, in addition to using Ozoneville FAUA HPMS data, HPMS data representing the rural portion of the state will be factored in to account for the portion of the nonattainment area outside of the Ozoneville FAUA. Local-road VMT within the nonattainment area will be calculated from countywide local road VMT estimates and added to HPMS-derived VMT.

Most of the resources expended in this portion of the inventory will be spent developing and reviewing (QC level) the data inputs for the MOBILE model, checking the reasonableness of the VMT estimates, and reviewing the final emission estimates. Some specific input data needed include vehicle registration and vehicle type distributions, fuel characteristics, vehicle operating conditions, and ambient temperatures. Data on these and other input data needed will be obtained primarily from the U.S. EPA's Office of Mobile Sources, the Ozoneville Department of Transportation, and the Ozoneville Department of Motor Vehicles.

QC procedures that will be implemented to ensure that the onroad mobile source inventory is of high quality will include data verification checks, comparison of model input data with original data, and comparison of overall emissions estimates with estimates developed for similar urban areas.

Developing an onroad mobile sources emission inventory requires data from a number of diverse organizations. These groups do not normally interact with one another, so

to help ensure the production of a high-quality onroad motor vehicle inventory, a working group of representatives from each organization will be formed. This group will identify the type and source of the needed data, and coordinate the data acquisition process. The group members and the primary data each will contribute will be:

- Mr. Dale Earnhart, Ozoneville Association of Governments. The Association of Governments will have primary responsibility for calculation of the onroad vehicle emissions, and will also contribute data developed from the regional transportation model. Mr. Earnhart will chair the working group.

- Ms. Shirley Muldowney, Ozoneville Department of Transportation. The Department of Transportation will contribute HPMS data and countywide VMT estimates from local roads.

- Mr. Al Unser, Ozoneville Department of Motor Vehicles. The Department of Motor Vehicles will contribute vehicle registration distribution data.

- Mr. A.J. Foyt, ODEQ. ODEQ will contribute input data for the MOBILE model, including vehicle inspection and maintenance parameters and fuel vapor pressure data.

- Mr. Michael Andretti, ODEQ. Mr. Andretti will provide independent review of the data flow and calculations.

The VMT data needed to cover the nonattainment area are:

- HPMS data for the Ozoneville FAUA, which includes Ozoneville as well as Counties A, B, C, and D.

- HPMS data for the portion of the Ozoneville nonattainment area in Counties A and B that is outside of the Ozoneville FAUA; and

- Local-road VMT for urban and rural roads for the nonattainment area.

HPMS data for the Ozoneville FAUA will be used in its entirety, because all of the FAUA is contained in the nonattainment area. For the portions of Counties A and B that are outside of the Ozoneville FAUA, HPMS data representing samples from rural roads in the state will be factored in based on the ratio of road mileage (by functional class) within the affected area versus the rural statewide total.

Local-road VMT will be estimated from existing countywide VMT estimates generated by the Ozoneville Department of Transportation. For those areas of Counties A and B that are only partially contained with the Ozoneville nonattainment area, local-road VMT will be estimated by factoring the countywide total by the ratio of local-road mileage within the nonattainment area to the total local-road mileage in the county. Note that these local-road VMT represent annual averages and must be factored in to correctly represent seasonal daily VMT. To achieve consistency with the treatment of the HPMS data, SAFs used in the Ozoneville FAUA to factor collector road VMT will be used to adjust the local-road VMT.

Specific QC measures to be taken to check the accuracy and reasonableness of the VMT estimates will include, at a minimum:

- Independent review of all calculations to verify application of the ratio techniques, use of correct expansion factors, and correct transferral of VMT input and output data;
- Comparison of the distribution of nonattainment area VMT by functional class to the statewide totals published in *Highway Statistics* (U.S. DOT) for 1996;
- Calculation of ratios of VMT on a per capita basis, per gallon of fuel used (by vehicle type after applying VMT ratios), and per road mile (by functional class). These ratios will be compared for reasonableness to similar ratios calculated for the state and other similar states from *Highway Statistics*; and
- Verification of the inclusion of all input HPMS and Ozoneville Department of Transportation local-road VMT data.

If an additional check is deemed necessary, a real-time simulation using one of the available vehicular flow models will be performed. This additional check will be performed if it appears that HPMS data have significantly underestimated truck VMT (and overestimated automobile VMT).

Emission factors will be generated using the MOBILE model from EPA. Inputs to the model will include a number of region-specific parameters as well as some national defaults. Region-specific parameters will include:

- Model year vehicle registrations distributions by vehicle class;
- Diesel sales fractions by model year;
- Statewide VMT distributions by vehicle class;
- Trip length distributions;
- Vehicle inspection and maintenance and antitampering program parameters;
- Vehicle speeds by functional class;
- Vehicle operating modes;
- Daily minimum and maximum temperatures; and
- Fuel characteristics including vapor pressure and oxygenate content.

MOBILE defaults of tampering rates and mileage accumulation rates will be used.

One of the critical areas of QC at this stage is to ensure the correct entry of data into the MOBILE model. The required input files are strictly formatted, but not amenable to easy interpretation. This raises the possibility of errors in the inputs going undetected. Therefore, two primary methods will be used to QC the use of the appropriate data as MOBILE inputs:

- Independent review of MOBILE inputs to ensure correct entry into the model, utilizing the MOBILE Input Data Analysis System (MIDAS) to provide a structure for checking the model inputs. MIDAS formats the model inputs for easier review, and performs additional QA to determine if the model inputs conform to specifications for the inventory type.
- Independent review of MOBILE model output files to determine if the model echoes the correct input parameters.

Once emissions have been calculated, a number of QC measures will be implemented to check the accuracy of the calculations and the reasonableness of the results. The planned QC measures will include, at a minimum:

- Independent review of the calculations, including review of data transfer from the MOBILE results to the calculation database, checking a sample of the calculations by hand for errors in the process, and review of the data transfer from the calculation database to the summary formats.

- Comparison of the results versus other independent variables to check for abnormalities in the calculations. These will include checks to:

  - Summarize emissions by pollutant on a per capita basis for each county;

  - Summarize emissions by pollutant versus VMT for each county. This provides a back-calculation of an overall emission factor that can be compared to separate MOBILE runs using average speeds and daily minimum and maximum temperatures, to check for unusual results.

  - Summarize emissions by pollutant and road functional class;

  - Compare the per capita, per VMT, and road functional class results to other inventories for the same year; and

  - Compare the percentage contribution by pollutant of onroad mobile emissions to the overall inventory to other inventories for the same year.

Variation of the results from the other inventories do not automatically indicate errors, but provide reasons to perform additional QC of the results.

9.2 Nonroad Mobile Sources

The U.S. EPA hired Energy and Environmental Analysis, Inc., to update the nonroad equipment category inventories for 33 ozone nonattainment areas in the United States. Although the Ozoneville nonattainment area is not one of the 33, the U.S. EPA concluded that the Washington, DC-Maryland-Virginia Metropolitan Statistical Area (MSA)

is similar in climate and economic conditions to Ozoneville. Therefore, a ratio of the populations of the two areas will be used in combination with the Washington, DC-Maryland-Virginia MSA inventory to develop the nonroad emissions estimates in the Ozoneville inventory.

There are three distinct U.S. EPA inventories that can be used to extrapolate nonroad emissions to the Ozoneville nonattainment area:

- Inventory A
- Inventory B
- (A+B)/2

The average of Inventories A and B will be used for nonroad mobile sources in Ozoneville based on guidance provided by the U.S. EPA.

QC procedures for the nonroad mobile source emissions estimates will consist of:

- Verification by the Task Leader and senior peer reviewers that the Washington, DC-Maryland-Virginia MSA is appropriate as a surrogate for Ozoneville;
- 100 percent QC of the spreadsheets provided by the U.S. EPA; and
- QC level reviews of data input (to identify transcription errors), calculations, and data conversions.

In assessing the applicability of the Washington, DC-Maryland-Virginia MSA inventory for Ozoneville, an overall comparison of the two regions and a detailed examination of key sources will be conducted. In the overall assessment, it will be determined if each of the sources present in the Washington, DC-Maryland-Virginia MSA inventory is also present in Ozoneville, or if potentially significant activities in Ozoneville are not present in the Washington, DC-Maryland-Virginia MSA inventory. For those sources that should be added to the Ozoneville inventory, a rough estimate of emissions will be made

based on data in the U.S. EPA inventories for more applicable regions. This rough estimate will be used to guide the level of effort employed to develop a more refined estimate.

In the detailed assessment, the key source types in the Washington, DC-Maryland-Virginia MSA inventory will be identified with the largest contribution of each pollutant. Additional attention will then focus on developing independent assessments of these sources for comparison purposes. For example, the key sources that contribute more than 10 percent of the total offroad emissions for either VOC or NO_x are:

- Construction equipment;
- Airport service equipment; and
- Lawn and garden equipment.

Developing emission estimates for these sources based on population ratios may or may not result in reasonable estimates. For example, for construction equipment, data will be collected on the number of permitted construction projects, and the Washington, DC-Maryland-Virginia MSA and Ozoneville data will be compared. Average emissions by equipment category will be compared between the two regions. If there is a difference between the two, the emissions estimates developed based on the permit data will be used provided it is complete.

10.0 BIOGENIC SOURCE INVENTORY PREPARATION AND QA/QC ACTIVITIES

There are three computer models that can be used to estimate biogenic emissions:

- Biogenic Emission Inventory System-2 (BEIS-2);
- The personal computer (PC) version of BEIS, PC-BEIS2.2; and
- Biogenic Model for Emissions (BIOME).

The BEIS models, BEIS-2 and PC-BEIS2.2, have default land use files for all counties in the U.S. (except those in Alaska and Hawaii). An alternative approach to using these models is to collect local information to substitute for model defaults. In the initial inventory planning phase, each of these methods was reviewed. On the basis of these reviews, it was determined that the preferred method for estimating biogenic emissions is with the U.S. EPA's BEIS-2 computer model. BEIS-2 is the most scientifically advanced model for estimating biogenic ozone precursor emissions.

BEIS-2 estimates VOC emissions for forested areas by multiplying the foliar density for each forest type by the appropriate emission factors. The emission rates are then adjusted for specific environmental conditions using user-supplied temperature and solar energy change data and output files of the Urban Airshed Model (UAM) temperature preprocessor. Similar calculations are used to estimate emissions from nonforested areas.

Meteorological data will be obtained from the National Weather Service and the U.S. EPA. U.S. EPA-supplied land use and biomass data sets provided with the model will be used.

In reviewing the estimates developed with BEIS-2, priority will be given to verifying the modeling days selected. In addition, the selection of the meteorological station will be reviewed. Typically the nearest station is recommended and used, but elevation and topography differences must also be considered in order to determine if there is a more

suitable station other than the closest. The default land use data in BEIS-2 will be evaluated to determine if they are representative of base year data, reality checks will be performed on genus/land use proportions, and the Federal Information Procedures System (FIPS) code will be checked to verify that the correct county data were used.

11.0 DATA REPORTING

Reporting will be accomplished by submittal to the U.S. EPA of written documentation and emissions summaries. The procedures, assumptions, sample calculations, and summary tables of emissions will be thoroughly documented in the ozone inventory report.

The report will include summary tables, raw listings of equipment, activity levels and emissions from individual sources, and a QA documentation section. A detailed inventory report allows comparison of baseline inventories from one area to another, the evaluation of the impact of control strategies, and facilitates updates to the inventory and development of projection inventories.

In addition to EIIP guidance, the 1992 U.S. EPA report *Example Documentation Report for 1990 Base Year Ozone and Carbon Monoxide State Implementation Plan Emission Inventories* will be followed (U.S. EPA, 1992a). These documents provide guidance for presenting and documenting SIP emissions inventories, and contain examples of how to present and verify inventory development efforts. The QA documentation section of the emissions inventory report will provide enough detail so that the inventory development described in the report can be compared to the information provided in this QAP. Any discrepancies will be identified and explained.

The QA documentation section of the inventory report will also include the audit report. As discussed previously, the audit report will describe each deviation from approved procedures or findings that could compromise the successful outcome of the inventory. Documentation of each finding will include a description of the action or data reviewed that led to the quality concern, along with a recommendation for corrective action. The QA documentation section of the inventory report will then discuss how the recommended corrective actions were implemented.

12.0 REFERENCES

Birth, T.L. 1995 User's Guide to the Personal Computer Version of the Biogenic Emissions Inventory System (PCBEIS2.2). Prepared for the U.S. Environmental Protection Agency, Office of Research and Development, Research Triangle Park, North Carolina.

Emission Inventory Improvement Program (EIIP). 1996. Volumes II-VI. Prepared by the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO).

Federal Highway Administration. Highway Performance Monitoring System (HPMS). U.S. Department of Transportation, Washington, D.C.

Highway Statistics, U.S. Department of Transportation, Federal Highway Administration, Washington, D.C. Annual Publication.

U.S. EPA, 1996a. Mobile Source Emission Factor Model (MOBILE). Office of Mobile Source Air Pollution Control, Ann Arbor, Michigan.

U.S. EPA, 1996b. Landfill Air Emissions Estimation Model (LAEEM). Office of Research and Development, Research Triangle Park, North Carolina.

U.S. EPA, 1995. Compilation of Air Pollutant Emission Factors, 5th Edition and Supplements, AP-42, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA, 1993. User's Guide for the Urban Airshed Model, Volume IV: User's Manual for the Emissions Preprocessor System 2.0, Part A: Core FORTRAN System, EPA-450/4-90-007D(R). Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA, 1992a. Example Documentation Report for 1990 Base Year Ozone and Carbon Monoxide State Implementation Plan Emission Inventories. EPA-450/4-92-007. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA, 1992b. Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, EPA-450/4-81-026d. (Revised). Office of Mobile Sources, Ann Arbor, Michigan.

U.S. EPA, 1991a. Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume I: General Guidance for Stationary Sources, EPA-450/4-91-016. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA, 1991b. Emission Inventory Requirements for Ozone State Implementation Plans, EPA-450/4-91-010. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA, 1991c. Emission Inventory Requirements for Carbon Monoxide State Implementation Plans, EPA-450/4-91-011. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA, 1991d. Nonroad Engine and Vehicle Emission Study Report. EPA-21A-2001. Office of Mobile Sources, Ann Arbor, Michigan.

U.S. EPA, 1991e. Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume II: Emission Inventory Requirements for Photochemical Air Quality Simulation Models, EPA-450/4-91-014. Research Triangle Park, North Carolina.

U.S. EPA, 1990. Surface Impoundment Modeling System (SIMS) User's Manual. EPA-450/4-90-019a. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. EPA, 1988. Guidance for the Preparation of Quality Assurance Plans for O_3/CO SIP Emission Inventories, EPA-450/4-88-023. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

APPENDIX A

QUALITY ASSURANCE INVENTORY CHECKLIST

Auditor _____
Date _____

Personnel Interviewed _____

This audit checklist is to be used to document the findings from the audit of activities and data associated with the Ozoneville emissions inventory. Use applicable parts of the checklist to identify the quality concerns associated with each task. Document the results and use them to generate the audit report.

I. MANAGEMENT OF THE WORK

A.	Is the QAP available to the personnel audited?	Y/N
B.	Are the procedures applicable to their work understood and followed?	Y/N
C.	Are the procedures adequate for the desired outcome of the work performed?	Y/N
D.	Are meetings held routinely to discuss the progress of the work and any quality problems that were found?	Y/N
E.	Are the personnel adequately trained to perform the duties assigned?	Y/N
F.	Are the resources required to perform the duties assigned available and adequate to achieve the objective of the work?	Y/N
G.	Is the work on schedule?	Y/N

II. DATA MAINTENANCE AND COLLECTION

A. Are the data used for the inventory coded to facilitate tracking? Y/N

B. Are the data organized to facilitate retrievals? Y/N

C. Does the data file include of all of the data required to estimate the emissions from a given source? (Check about 4-5 sources) Y/N

D. Are the data in a place where access is controlled and limited? Y/N

E. Are the data copied when requests are made for retrievals? Y/N

F. If originals are released to inventory development personnel, is the location of the original data documented in the data tracking database? Y/N

G. Is the data tracking database operational and used to track the receipt and distribution of the data? Y/N

H. Are the state permit applications and supporting data completed in a manner that will not lead to misinterpretation of the data? (Check for obscuring of data when making corrections, insufficient data to discern the identity and level of emissions of a given pollutant, unclear labels on attachments, etc.) Y/N

I. Are the data documented in black ink so that reproductions will include all of the data recorded on the data forms? Y/N

J. Are the data request forms complete? If not, what is done to acquire the missing data? Y/N

III. DATA EVALUATION

A. What steps were taken to ensure that the data collected are complete?

_____

_____

_____

B. What steps were taken to evaluate the accuracy, completeness, comparability, and representativeness of the data?

_____

_____

_____

C. What procedures were followed to eliminate double counting of sources or points within a source?

_____

_____

_____

D. How were sources below the cutoff point handled?

_____

_____

_____

E. Were task activities prioritized to provide emissions data about the highest emitters first? Y/N

F. Were discrepancies found in the data? If yes, what were they and how were they eliminated? Y/N

_____

_____

_____

G. Were calculations reviewed by another IDT member for technical soundness and accuracy? Y/N

Were results documented? Y/N

_____

_____

_____

H. Were evaluated data reviewed by a senior technical reviewer prior to entering it into the emissions database? Y/N

Were results from the data reviews documented and corrective actions implemented as requested? Y/N

If corrections were made, will the corrections affect other emissions data? Y/N

How was the impact of the erroneous data evaluated?

_____

_____

_____

I. Were the data validation procedures and activities adequately documented in the bound project notebook assigned to the persons evaluating the data? Y/N

If no, describe the problems found.

_____

_____

_____

IV. EMISSIONS DATABASE DEVELOPMENT

A. Were the data validated prior to being entered into the database? Y/N

B. Were the data presented to the entry personnel recorded in a manner that facilitated entry into the database? Y/N

C. Was all of the information required to be entered in the database included on the data form? Y/N

D. If data are missing from data request forms, how are data gaps handled?

_____

_____

E. Were results in the units to be reported? If not, were calculations performed manually or electronically? Y/N

_____

F. Were the database activities documented in the bound project notebooks? Y/N

Did the data recorded allow reconstruction of the activities? Y/N

Were pages in the notebook reviewed and signed by the senior technical reviewer? Y/N

G. Were data entries reviewed for transcription errors by someone other than the person entering the data into the database? Y/N

If problems were found, were the resolution of them documented and the revision of the data indicated in the electronic file? Y/N

H. Was the database developed so that revised versions of the database are identified? Y/N

I. Were the software and hardware evaluated to determine whether they are adequate to achieve the objectives of the computer database activities prior to using them? Y/N

What tests were performed and were the results from the tests documented? (response time, available memory, available power, accessibility for use)

_____

_____

_____

J. How often are files backed up?

_____

Is the schedule appropriate to minimize data loss? _____

K. Was a log maintained of database revisions? Y/N

L. Are the computer manuals available for use by the operators? Y/N

Does the manual include all of the data needed to log into the system and perform the duties required to develop the emissions database? Y/N

V. REPORTING

A. Was the report formatted as required by U.S. EPA? Y/N

B. Was the report clearly written and inclusive of the applicable emission source identified during the planning phase of the work? Y/N

If a source was missing, can the reason for the omission be verified to be acceptable? Y/N

C. Did the report accurately reflect the data included in the database? (Compare the results in the report to the information included in the database for 5-10 sources). Y/N

D. Was there evidence in the data file of editorial and technical review of the document? Y/N

E. Was a copy-ready version of the report included in the master data file? Y/N

VI. QUALITY CONTROL

A. Were the QC measures taken adequate to ensure data quality? Y/N

B. Were the project and quality goals met? Y/N

C. Were actions taken in response to all previous recommendations for corrective actions? Y/N

Did the actions taken adequately address the quality concerns found? Y/N

_____

_____

_____

VII. RECOMMENDATIONS FOR CORRECTIVE ACTIONS

VIII. COMMENTS

APPENDIX B

QUALITY CONTROL CHECKLIST

Auditor: _____ Date _____

Data/Procedure Reviewed: _____

_____

Inventory Development Personnel Involved in Work: _____

_____

Select a facility or source category with high emissions and evaluate the quality of the data and adequacy of the data handling procedures (access, organization, completeness, etc.). Record the findings and recommendations for corrective actions, if any, on the checklist and comment sheet provided.

If recommendations for corrective actions are made, discuss them with the Task Leader immediately following the audit. Conduct follow-up activities to determine if the actions taken in response to the recommendations appropriately resolved the quality issues identified.

I. DATA

A. Identify the source evaluated.

_____

B. Describe the data included in the master file for the facility or source category.

_____

_____

_____

C. Are the data documented in a manner that will not have the potential to be misinterpreted? Y/N

Were the instructions for documenting the data followed? Y/N

D. Are there missing data fields? Y/N

What procedures are taken by the Data Manager and Task Leaders to ascertain missing data?

_____

_____

_____

At what point in the inventory process are requests for missing data made?

_____

_____

_____

How is the receipt of the missing data handled? (Are original data sheets placed in the master file?)

_____

_____

_____

Is the procedure followed to ascertain missing data efficient and adequate? Y/N

E. Are emissions types given (e.g., actual, allowable, maximum design capacity)? Y/N

F. Are the procedures used to calculate emissions described in the data provided? Y/N

G. Are the emissions determined in a technically sound manner? Y/N

H. Are sufficient data provided to recalculate the emission results? Y/N

Verify the accuracy of the calculations of the emissions for some of the pollutants. (Attach calculation sheets to the checklist.)

If any of the values are incorrect, explain how the emissions data were corrected.

I. How are unavailable data identified? Are they mentioned in the report?

II. EMISSIONS DATABASE

A. Do the values reported on the data sheets reviewed agree with the entries in the database? Y/N

B. Who provided the data to the data entry personnel?

C. Was there evidence that the data were reviewed for accuracy and completeness prior to submittal to the data entry personnel? Y/N

D. Were the data sheets complete when they were received? Y/N

E. Were copies or original data sheets submitted to the data entry personnel? Y/N

If original data sheets were used, do the data tracking records show the release of the original data to the data entry personnel? Y/N

F. Were the QAP and a user's manual accessible to the data entry personnel? Y/N

G. Were the personnel adequately trained to perform the duties assigned? Y/N

H. Were the procedures followed in agreement with those specified in the QAP? Y/N

I. Is the database routinely backed up at the end of each updating event? Y/N

J. Does the computer allow double entries for the same source? Y/N

K. Are default values understood and properly documented? Y/N

L. Are key data fields flagged when data are not entered or are not available? Y/N

M. Ask the data entry personnel to explain the QC procedures followed to ensure data quality.

Do they agree with the procedures described in the QAP? Y/N

N. Does the computer system appear to be adequate for its intended use? (Ask the data entry personnel about the problems they have experienced with the system.) Y/N

O. Is the data entry progressing as expected and are the procedures followed adequate to ensure data quality? Y/N

_____

_____

_____

III. RECOMMENDATIONS FOR CORRECTIVE ACTIONS

IV. COMMENTS

APPENDIX C

EMISSIONS INVENTORY DATA ELEMENT CHECKLIST

Name _____

Data Reviewed _____

Date _____

A permit will not be considered complete for use in the emissions inventory if the following data elements are not in the permit application. Look in the permit application for each data element and check the space next to the data element to determine if the information requested was provided.

(1) Facility name _____
(2) Facility address, including city _____
(3) Zip code _____
(4) County or city _____
(5) Business description or SIC Code _____

(6) Design capacity emissions (if applicable)
Explanation if not applicable:

_____

(7) Projected emissions (hourly and annually, if applicable) _____
Explanation if not applicable:

_____

(8) Allowable emissions (hourly and annually, if applicable) _____
Explanation if not applicable:

_____

In some cases, an emission type, such as design capacity emissions, may not be applicable for that process or source. If that is the case and no emissions are reported for that emission type, provide a brief explanation below.

_____

_____

_____

APPENDIX C (CONTINUED)

EMISSIONS INVENTORY DATABASE CHECKLIST

Name _____

Data Reviewed _____

Date _____

Data entered into the Air Pollutant database should be checked for missing data elements. Use this list to check representative facilities in the database. Look at the facility records for the following data elements, and check the space next to the data element name if the information was provided. In some cases, an emission type, such as design capacity emissions may not be applicable for that process or source. If that is the case and no emissions are reported for that emission type, provide a brief explanation on this form.

(1) Facility name _____
(2) Facility address, including city _____
(3) Zip code _____
(4) County or city _____
(5) County code _____
(6) Facility code _____
(7) Business description or SIC Code _____
(8) Design capacity emissions (if applicable) _____
Explanation if not applicable:

_____

_____

(10) Projected emissions (hourly and annually, if applicable) _____
Explanation if not applicable:

_____

_____

(11) Allowable emissions (hourly and annually, if applicable)
Explanation if not applicable: _____

_____

_____